

natural career? Why are all the doctors of the human species, with their flowing knowledge and consummate skill, to carry out cure? Why are they so set at naught, that the lower animals, who have no advantage of their services, have a higher vital possession than man at their command?

"The answer is told in a few words. It is that we have never as a community let ourselves study the question; have never, in truth, looked at the facts, plainly as they stand forth.

"And now comes another question—Knowing the facts; knowing what is the natural term of human life, can mankind learn to attain that term? Can man learn to live his hundred years, with a prospective chance of extension to a fifth of a century more? Instead of being cut down at the moment when he has filled his intelligent mind with the learning of his time, and when his knowledge is just becoming transmutable into wisdom, can he go on, an intellectual being, brought to the highest pitch of usefulness? Can he go on to the full term of his natural and prospective course?

"I do not dare answer that question on my own account, because it is answered for me. He who gave the life has answered the question. He has written it for us in unmistakable language. He has shown all of us who can read His natural designs, that it is one of them that man may live the term if he will. Free-will making a man a free agent, is all that is set above the natural law, and free-will is natural law too, government by intelligence which is as natural, and is as freely supplied.

"How, then, shall civilised man live, that the natural term may be found?"

Dr. Richardson then proceeded to sketch his ideal Salutland, located somewhere to the extreme south of Mr. Hepworth Dixon's "New America," the time being the middle of the twenty-first century. He depicted its polity, its social and domestic life, its people, its work, its sanitary arrangements.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE

THE ninth session of the Newcastle College of Science was opened on the 13th inst., when very satisfactory reports of the progress of the institute were made. Prof. Lebour delivered the inaugural address on Some Aspects of Geology. Interesting and genial speeches were given by Lord Ravenworth, the Dean of Durham, and others.

FROM the Calendar of Anderson's College, Glasgow, we see that a very complete education can be obtained at that institution in science and medicine, the fees being unusually low. The Calendar has an interesting sketch of the life of John Anderson, F.R.S., the founder of the college, as also of the institution itself.

M. FERRY, the Minister for Public Instruction, having arrived in Paris, has visited the Observatory and the School of Medicine, where important works are being carried out. One of the peculiarities of the new buildings will be the large number of dissection rooms. More than a hundred tables will be prepared for dissections, so that every student in medicine will be enabled to take part in *épreuves pratiques*, which will be an essential part of the education of medical students.

THE new college so liberally endowed by Mr. Mark Firth, at Sheffield, was opened on Monday by Prince Leopold. The endowment, it is expected, will soon reach 25,000/., and the institution is mainly intended for carrying out the University extension scheme, which has been remarkably successful in Sheffield. The building seems to be altogether satisfactory, and, we are glad to see, contains provisions for experimental instruction in chemistry and physics. Prince Leopold insisted on the great benefits which must accrue to the working classes from the establishment of such an institution.

PROF. MAX MÜLLER, on Monday night, delivered the president's inaugural address on the opening of the winter session of the Birmingham and Midland Institute. His German and Italian friends, he said, while recognising that full political liberty reigned here, thought there was little intellectual freedom, and that, however it might be in London and a few other large cities, the Universities—the nurseries of thought and learning—were fettered by the medieval spirit of monastic institutions and the principles of scholastic philosophy, which contrasted ill with the freshness and freedom of Continental Universities.

SCIENTIFIC SERIALS

The Quarterly Journal of Microscopical Science, October.—W. B. Scott and H. F. Osborne, On some points in the early development of the common newt, with pl. 20 and 21.—E. Ray Lankester, On the structure of *Haliphysema Tumanowiczi*, with pl. 22, generally confirming the facts recorded by Mr. Saville Kent, and failing to observe the collar-bearing flagellate cells described by Haeckel. Prof. Lankester shows the structure to be however not quite so simple as that which is supposed to characterise the body substance of such Foraminifers as the Lituolida.—E. Ray Lankester, On a new genus and species of Gymnomyxæ (*Lethamæba discus*) pl. 23.—H. Gibbes, On the structure of the vertebrate spermatozoon, pl. 24.—Index to volume xix., N.S.

The American Naturalist, September.—Brazilian corals and coral reefs, by R. Rathbun.—The formation of Cape Cod (concluded), by W. Upham.—The hillocks or mound-formation of San Diego, California, by Dr. G. W. Barnes.—Insect powder, by W. Saunders.—Recent literature; General notes; Scientific news; Proceedings of Scientific Societies; Selected articles.

Journal de Physique, September.—M. Bouty here describes some mechanical phenomena which accompany electrolysis; his paper treats (1) of pressures exerted by galvanic deposits, (2) of the action of heat on metallised thermometers, and (3) of peculiarities of nickel.—M. Sebert gives an account of the accelerograph of M. Marcel Deprez, in its most recent form; the apparatus is for measuring pressures developed by gases from powder (which are caused to act on a piston).—There are also notices of M. Deprez's magneto-electric machine (in which a Siemens armature is arranged to work between the branches of a horse-shoe magnet, being about equal to these in length), and a new form of electroscope, by M. Guerout.

Asiatic Society of Bengal, vol. 47, No. 223, N.S., April 6.—Description of *Thaumantis louisa*, pl. 12, from Upper Tenasserim, by J. Wood Mason.—On a great snow-fall in Kashmir, by R. Lydekker.—Physiographical notes, &c., on Tanjore, by Lieut.-Colonel B. R. Branfell.—On the proper relative sectional areas for copper and iron lighting rods, by R. S. Brough.—Description of a new Homopteron (*Cosmoscarta masoni*), by W. L. Distant.—On the Indian species of the genus *Erinaceus*, by Prof. Dr. Anderson, with 4 plates.—On a supposed new hedgehog (*Erinaceus niger*) from Muscat Arabia, with a plate.—On *Arvicola indica*, Gray, and its relations to the sub-genus *Nesokia*, with a description of the species of *Nesokia* (pl. 13 and 14), by Prof. Dr. Anderson; Index to Volume.

Morphologisches Jahrbuch, Bd. 5, Heft 2.—A. Pansch, Memoir on the morphology of the cerebral hemispheres, in mammalia, pl. 14 and 15.—H. Strasser, On the development of the limb cartilages in Salamanders and Tritons, pl. 16-19.—G. v. Koch, Notes on the skeleton of corals, pl. 20.—M. Fürbringer, On the question of the formation of nerve plexi, pl. 21, 22.—C. Semper, Reply to Prof. Fürbringer's article "On Homology."—Prof. Fürbringer, On the chief points alluded to in Prof. Semper's reply.—Notices.

Zeitschrift für wissenschaftliche Zoologie, Bd. 32, Heft 4, August.—On the worm fauna of Madeira, by Prof. Langerhans, pl. 31-33. Describes a large number of new genera and species.—Researches into the structure and development of the Sponges, seventh notice: The family of the Spongidae, by Prof. F. E. Schulze, pl. 34, 38.—*Typhloscolex mülleri*, W. Busch, being a supplement to notes on the pelagic annelids of the coasts of the Canary Islands, by Prof. R. Gree, pl. 39.—On the oral skeleton of Asterids and Ophiurids, by Dr. H. Ludwig.

SOCIETIES AND ACADEMIES

LONDON

Entomological Society.—October 1.—Sir John Lubbock, Bart., F.R.S., president, in the chair.—The President alluded to the loss which the Society had sustained by the death of Mr. Wm. Wilson Saunders, F.R.S., and a former President of the Entomological Society, and announced that the council had accepted the responsibility of awarding two prizes offered by Lord Walsingham and other gentlemen for the best and most complete life-his-

tories of *Sclerostoma syngamus*, Dies., and *Strongylus pergracilis*, Cob., supposed to produce the so-called "gapes" in poultry and other birds, and also the grouse disease. Messrs. Stainton and McLachlan, both objected to the Society dealing with subjects relating to the *Entozoa* which could in no case be considered as entomology, for the study of which the Society was founded, and considered that the matter would have been more properly placed in the hands of the Linnean or Zoological Societies.—Mr. Philip Hy. Gosse, F.R.S., of Torquay, was elected an Ordinary Member.—Mr. McLachlan exhibited specimens of the hemipterous insect, *Anthocoris nemorum*, reported to be doing great damage to hops growing in the neighbourhood of Canterbury, but the exhibitor suggested that it was on the hops in search of aphides or other small insects, and therefore beneficial to the hop-grower. He also exhibited examples of the larvæ of one of the *Embida* found by Mr. Wood Mason at Jubbulpore. Mr. McLachlan further called attention to the sculptured stones on the shores of Lake Leman, previously referred to and considered by Prof. Forel to be due to the action of trichopterous larvæ. From a recent examination of many similar stones on the shores of Lake Neuchâtel Mr. McLachlan inclined to the opinion that the markings were caused by Mollusca.—Mr. Pascoe exhibited a specimen of a species of the *Acrididae* remarkable for its aquatic habits, which was found in some numbers on the surface of a pool near Pará.—The Rev. A. E. Eaton exhibited larvæ, pupæ, and cases of species of *Hydropsila* (restricted) collected in the neighbourhood of the Haute Savoie, describing their habits and referring to a case of synonymy to which they had given rise.—Sir John Lubbock exhibited a specimen of *Ochesella rufescens* taken in Kent, being a species of Collembola new to Britain.—Mr. E. Boscher exhibited a coloured drawing showing the extreme forms of two varieties of the caterpillar of *Smerinthus ocellatus*, and remarked on their food-plants and habits.—The following papers were either read or communicated:—"Descriptions of Phytophagous Coleoptera," by Mr. J. S. Baly; "Descriptions of New Sphingidae," by Mr. A. G. Butler; and "On the Affinity of the Genus *Polyctenes*, West, with Description of a New Species," by Mr. C. Waterhouse.

Royal Microscopical Society, October 8.—Dr. Beale, F.R.S., president, in the chair.—Prof. Martin Duncan and four other gentlemen were elected Fellows, and eleven nominations were made for the November meeting.—Several valuable donations to the Society were announced, consisting of a revolving table, a ruling machine, and a clock, and of books, apparatus, and slides, for which special votes of thanks were given to the donors.—Mr. J. Beck read a paper on the structure of the scale of a species of *Mormo*, Mr. Gilbert on the morphology of vegetable tissues, and Dr. Stolterforth on a new species of the genus *Eucampia*.—In the discussion on the papers the President, Mr. Stewart, Mr. Beck, Mr. Gilbert, Dr. Edmunds, and Mr. Crisp took part.

PARIS

Academy of Sciences, October 15.—M. Daubrée in the chair.—The following papers were read:—On the present state and the future of thermo-chemistry, by M. Berthelot. The author presented his new work, "Essai de Mécanique chimique fondée sur la Thermochimie," comprising the matter of some 300 memoirs published in the *Annales de Chimie*, &c. The first of the two volumes treats of calorimetry: its first part expounding the theoretical rules, its second experimental methods, while its third contains numerical data accumulated during the last sixty years by physicists and chemists, on heats of combination and of physical changes and on specific heats. The first part of the second volume comprises the general study of chemical combination and decomposition, and principally that of systems in equilibrium between two contrary tendencies. The next part deals with the fundamental object of the work, the prevision of reciprocal actions of substances, and the rules by which it is determined, which are deduced from the principle of maximum work. This simple principle separates effects due to chemical energies, between particles of ponderable matter, and foreign energies between ponderable matter and the etheric medium. This separation is (in the author's opinion) the chief original feature of the work. The prevision of phenomena, from numerical data of thermo-chemistry seems to him destined to work great changes in chemical science.—Regular alignments of joints or diaclases, in the tertiary strata of the environs of Fontainebleau; their relation with certain features of relief of the ground, by M. Daubrée.—M. Marey announced, by letter, that he had received an electrical *Gymnotus* alive from Para. Having recovered from the

fatigues of the voyage, it now gives strong discharges when touched; it also grows tame and eats gudgeons offered it. It is placed in an aquarium at 25° C. The discharges are not so violent as those of a *gymnotus* received last year, which, wounded and ill, died soon after being experimented with, and which was probably frightened and angry when touched.—The President announced, with regret, the death of M. De Tessen, Member of the Section of Geography and Navigation.—Production of a new manure capable of meeting the requirements of agriculture, by M. De Molon. He utilises wrack or seaweed, mixing them, in successive layers, in pits, with pulverised phosphate of lime, in proportions suitable for fermentation. The mixture is allowed to ferment six weeks to two months, according to the season, and if the decomposition of organic matter is not completed then, the compost is mixed anew for further fermentation. The manure thus produced contains, besides phosphate of lime, rendered very assimilable, the fertilising elements, nitrogen, mineral salts, potash, soda, and magnesia.—A note by General Ibáñez, accompanying the second volume of "Memoirs of the Geographical and Statistical Institute of Spain," was presented.—On the separation of roots of an algebraic equation with numerical coefficients, by M. Laguerre.—Experiments on the electric discharge of the chloride of silver battery, by Messrs. Warren de la Rue and Müller.—Action of metallic nitrates on monohydrated nitric acid, by M. Ditte. Certain nitrates combine with the acid named to form acid salts. Others (of which nitrate of magnesia is a type) are fused, under heat, in their water of crystallisation, which is then liberated along with nitric acid, and there remains a matter containing still more or less water, neutral nitrate, and either a sub-nitrate or an oxide. On contact with the monohydrated acids, the sub-salts are changed into neutral nitrates, setting at liberty some water, which is added to what the matter still contains, and which cannot be separated without decomposing the matter entirely. (The nitrates of manganese, zinc, alumina, iron, and manium, also belong to this group). A third, and the largest group of nitrates, are simply insoluble or extremely little soluble in the acid considered. Nitrate of lead may be taken as a type.—On nitrate of silicon, by M. Schutzenberger.—On the physiological action of *Strychnæa* of South America, by M. Jobert. He has tried several of these, and finds they all act similarly; they are not tetanising like the strychnæa of Asia. They quickly affect the motor-nervous system, not affecting the sensibility and the circulation.—On the treatment of sympathetic ophthalmia, by section of the ciliary nerves and the optic nerve, in place of removal of the eye, by M. Boucheron.—On the innervation and circulation of the breast, by M. Laffont. The breast contains true dilator nerves, as well as those which, when excited, cause increase in the quantity of milk secreted.—Origin and morphological value of the different pieces of the labium in Orthoptera, by M. Chatin.

CONTENTS

	PAGE
THE INTRA-MERCURIAL PLANET QUESTION	597
AUSTRALASIA	598
OUR BOOK SHELF:—	
Oldham's "Geological Glossary for the Use of Students"	601
Reyer's "Über die Tektonik der Vulcane von Böhmen"	602
"An Essay on Spiritual Evolution considered in its Bearing upon Modern Spiritualism, Science, and Religion"	602
LETTERS TO THE EDITOR:—	
Sun-Spots in Earnest.—PIAZZI SMYTH	602
Climatic Effects of the Present Eccentricity.—JAMES CROLL	602
Greenwich Meteorological Observations.—ALEXANDER BUCHAN	602
Rag-Bushes.—S. P. O.	602
The Theory of Hailstorms.—J. A. B. OLIVER	603
Underground Tides.—MORRIS B. BELKNAP	603
The Uses of Tails.—LAWSON TAIT	603
OUR ASTRONOMICAL COLUMN:—	
Binary Stars	603
The Satellites of Mars	603
The Minor Planet, Pandora	604
Palisa's Comet	604
GEOGRAPHICAL NOTES	604
THE PLANETS OF THE SEASON. By Rev. T. W. WEBB	605
NORDENSKIÖLD'S ARCTIC VOYAGES (With Illustrations)	606
HERRING'S THEORY OF THE VISION OF LIGHT AND COLOURS. By Dr. WILLIAM POLE, F.R.S.	611
ALFRED HENRY GARROD	613
JOHN MIERES, F.R.S.	614
NOTES	614
THE SANITARY CONGRESS	617
UNIVERSITY AND EDUCATIONAL INTELLIGENCE	619
SCIENTIFIC SERIALS	619
SOCIETIES AND ACADEMIES	620